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(54) DEVICE FOR ALIGNING GRAPHICS AND METHODS FOR MAKING SUCH A DEVICE

VORRICHTUNG ZUM AUSRICHTEN VON GRAPHIKEN SOWIE VERFAHREN ZU DEREN
HERSTELLUNG

DISPOSITIF D'ALIGNEMENT DE GRAPHIQUES ET PROCEDES DE FABRICATION DE CE
DISPOSITIF

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Description

This invention relates to a device for aligning graphics and, more particularly, to a device for aligning a graphic with respect to a fixed reference. The invention further relates to methods for making such a device.

On site application of paint directly to a surface to be decorated is a time-honored method for providing decorative graphic designs. While this approach provides many desirable aesthetic and physical features including realistic appearance, color flexibility, and durability to abrasion, weathering and chemical degradation, it suffers from many disadvantages. Such disadvantages include the need for relatively skilled labor, long application times, and potential contamination to adjacent areas and mechanical equipment.

As a result, various prefabricated graphics have been developed. A typical prefabricated graphic comprises a plastic film having an adhesive on one surface and, optionally, a design or decoration on the opposite surface. The decorated surface is temporarily protected by an adhesive coated premask while the adhesive-bearing side is overlaid with a removable release liner until the graphic is applied.

Prefabricated graphics are widely used in the automotive industry to enhance, highlight and personalize the aesthetic appearance of motor vehicles. With regard to motor vehicles, some graphics extend in an interrupted or discontinuous manner from one surface to an adjacent but spaced apart surface. Other graphics extend continuously along a single surface. Frequently, the graphics are positioned relative to a fixed reference such as a body panel edge, a door edge, a window surround, a molding, a trim piece or another graphic. It may be important for the graphic to be carefully aligned with respect to the fixed reference in order to present an appealing, high quality, precision appearance.

Presently known graphic applicators do not readily permit the precise alignment of graphics demanded by automotive manufacturers. Using the prefabricated graphic described above as an example, the graphic is typically applied to a motor vehicle by removing the release liner and adhering the plastic film to the vehicle. If the graphic is to be positioned with respect to a fixed reference, alignment indicia (such as carats, dots, squares, notches, cut edges, etc.) on the removable premask are aligned with the reference.

Precise alignment of the graphic requires a fair amount of skill and attention to detail. More importantly, however, presently known techniques for fabricating graphics inherently make precise alignment of the graphic difficult. In a conventional graphic assembly process, an adhesive coated plastic film (i.e., the graphic) is laminated to a removable release liner. The plastic film may be decorated before or after the lamination to the release liner or not decorated at all. The graphic and release liner are then passed to a cutting device that "kiss-cuts" the plastic film without cutting through the release liner so as to define the shape of the

graphic. Excess plastic film is then removed or weeded. The removable premask is laminated to the plastic film and the composite structure is transferred to a second cutting device which cuts through the release liner, the premask, and, optionally, the film and which also provides the alignment indicia on the premask. For the graphic to eventually be properly aligned with respect to a surface requires that the premask/graphic/release liner construction be precisely placed in the second cutting device. This does not always occur.

Consequently, in those graphic applicators which are presently known, the minimum tolerance range is broad.

From US-A-3 484 972 a mounting assembly article is known in which a letter or the like to be applied to a surface is held between a mild pressure-sensitive adhesive coated cover sheet and an adhesive resisting backing sheet. The known article utilizes upper and lower lobes located outside of the area of the letter of the cover sheet, preferably transparent, having the front face of the letter adhered to the adhesive coated back face of same. The adhesive resisting backing sheet protects the strong pressure-sensitive adhesive coated back face of the letter. Removing said backing sheet from the back of said lobes allows the assembly to be temporarily fastened and held by them on a surface to be lettered, where the letter spacings and relative positioning can be viewed, measured, and adjusted before final adhesion following the removal of the rest of said backing sheet. Then the cover sheet is peeled off leaving the letters permanently anchored in place on the surface in their adjusted position.

It is the object of the present invention to provide a device for aligning a graphic on a surface which device permits graphics to be precisely aligned relative to a fixed reference such as a panel edge or an adjacent graphic.

According to the invention this object is solved by a device as defined in claim 1. A method for aligning such a device is defined in claim 5. Methods for making such a device are defined in claims 6, 10 and 14, respectively. The subclaims relate to various preferred embodiments of the invention.

In general, this invention relates to a device for aligning a graphic on a surface with respect to a fixed reference on the same or an adjacent surface. The fixed reference may be a panel edge, a door edge, a trim strip, a window surround, another graphic, a mirror, an antenna, etc. The invention is particularly useful when the two surfaces are spaced apart.

According to the invention the device comprises a graphic carrier which, in turn, comprises, a graphic carrier release liner and a first graphic. The first graphic includes a top face and a bottom face opposite the top face (also referred to as opposed first and second major faces), the graphic being removably secured to the release liner at one of its major faces.

The device further comprises a disposable, removable portion (also referred to as an extension portion)

adjacent to the graphic carrier. The extension portion comprises a second graphic having opposed top and bottom surfaces (also referred to as opposed first and second major faces) and a second release liner. The second graphic is adjacent to the first graphic. The second release liner is adjacent to and at least substantially separated from the graphic carrier release liner by a cut portion comprising a perforated cut or a continuous cut. The cut portion is inherently aligned with the edge of the first graphic, and aligns the first graphic with respect to a fixed reference of a surface to which the first graphic is to be applied. The device further includes a continuous premask that is releasably attached to the other major face of both the first and second graphic.

The at least substantial separation between the graphic carrier release liner and the second release liner provides means for aligning the first graphic. The alignment means may comprise a perforated cut in the release liner or an edge of the release liner that has been provided by through cutting the release liner.

The device according to the invention is particularly useful when the first graphic is to be aligned with another graphic that has already been applied. In these cases, the extension portion may include additional means for aligning the first graphic, such as a graphic design formed on the second graphic.

Presently known graphic applicators have a wide range of tolerances. A graphic applicator according to the invention allows a graphic to be positioned with a precision not heretofore possible.

The invention also relates generally to methods of providing a graphic applicator according to the invention. In one method, a graphic having first and second opposed major faces is provided and a release liner having opposed first and second ends is removably secured thereto. The release liner is at least substantially cut through between its opposed ends without cutting through a corresponding portion of the graphic so as to provide the means for aligning the graphic.

In another embodiment, the method comprises the steps of providing a first graphic, having first and second opposed major faces, removably securing a graphic carrier release liner having opposed first and second ends to one of the major faces of the graphic, cutting through the graphic without cutting through a corresponding portion of the release liner, and simultaneously cutting through another portion of both the graphic and the release liner. The second cutting operation provides the means for aligning the first graphic with the fixed reference.

The invention will be more fully understood with reference to the following drawings in which similar reference characters designate corresponding or analogous components throughout and in which:

FIG. 1 is a fragmentary, schematic bottom plan view of a precursor construction for providing a device for aligning graphics according to the invention and with several of the layers thereof having been par-

tially removed;

FIG. 2 is a fragmentary, elevational view of a device for aligning graphics according to the invention and similar to FIG. 1 but after the performance of certain cutting operations thereon and with several of the layers thereof having been partially peeled apart;

FIG. 3 is a sectional view taken along lines 3--3 of FIG. 2;

FIG. 4 is a sectional view similar to FIG. 3 but showing an alternative embodiment of the invention; and FIG. 5 is an enlarged, fragmentary, schematic, elevational view illustrating the application of a graphic to a surface and aligned with a fixed reference thereon using the graphic applicator of FIGS. 2 and 3, selected portions thereof having been removed to more clearly show the underlying construction.

Turning now to the drawings, FIGS. 2 and 3 illustrate a device 10 for aligning graphics according to the invention (hereinafter referred to as a graphic applicator). Graphic applicator 10 comprises a graphic carrier 12 and an extension portion 14. Graphic carrier 12 comprises a first graphic 16a which, in turn, includes a film 18a having an optional graphic design 20a (illustrated as several parallel pin stripes) on one face and an optional adhesive 22a on an opposite (or, though not shown separately, the same) face. The graphic carrier further includes a removable graphic carrier release liner 24a on a major (e.g., bottom) face of the graphic.

As explained more fully below, graphic carrier 12 and extension portion 14 are cut from common stock. Consequently, the constructions of graphic carrier 12 and extension portion 14 are usually the same. The similar components of the extension portion are identified by the reference numerals used to describe the construction of the graphic carrier, except that the reference numerals include the letter "b" rather than the letter "a". Thus, extension portion 14 comprises a second graphic 16b, a second film 18b, an optional second graphic design 20b, an optional second adhesive 22b, and a second removable release liner 24b.

Because graphic carrier 12 and extension portion 14 are cut from common stock, their individual components (i.e., graphics 16a and 16b, films 18a and 18b, etc.) are not provided until certain cutting operations, described more fully below, are performed. Consequently, a composite precursor construction 10' exists prior to the performance of these cutting operations. As shown in FIG. 1, composite precursor construction 10' comprises a graphic 16, which includes a graphic film 18 having an optional graphic design 20 formed thereon, an optional adhesive layer 22, and a release liner 24. (The various layers of FIG. 1 have been partially removed to more clearly show the construction.)

With reference to FIGS. 2 and 3 again, graphic applicator 10 further comprises a removable premask 26 which is common to and overlies both graphic carrier 12 and extension portion 14, the significance of which is explained more fully hereinbelow. More specifically, pre-

mask 26 is releasably attached to major faces of graphic carrier 12 and extension portion 14 which are opposite the major faces to which graphic carrier release liner 24a and second release liner 24b are removably secured. Premask 26 is added after the necessary cutting operations have been performed on precursor construction 10'. Premask 26 comprises a protective layer 28 having an adhesive layer 30 thereon.

The following discussion of the several elements of graphic applicator 10 refers specifically only to aspects of graphic carrier 12, it being understood that this discussion applies equally to the corresponding components of extension portion 14, unless noted otherwise. Graphic film 18a may be selected from a variety of polymeric materials such as polyolefins (e.g., polyethylene and polypropylene), flexible poly(vinyl halides) (e.g., poly(vinyl chloride), copolymers of ethylene, propylene and vinyl chloride, polyesters (e.g., polyethylene terephthalate), polyimides, polyurethanes, polycarbonates, polyamides, poly(phenylenesulfide), as well as blends and copolymers thereof. Nonpolymeric materials such as paper may also be used and are included within the scope of the term graphic film as used herein. The film may have a smooth, matte or other textured finish depending on the particular appearance which is to be imparted to the graphic. The film may be clear, pigmented or tinted.

Graphic design 20a is optional and, if included, may be provided by a variety of inks and the like, including those based on urethanes, acrylics, vinyls, vinyl-acrylic blends, and epoxies. The graphic design may include or be supplemented with non-colored or clear materials to provide a protective top coat (not shown separately in the drawings). In the formation of precursor construction 10', graphic design 20 may be applied to graphic film 18 by a variety of conventional techniques such as screen printing, ink-jet printing, electronically, electrographically, electrophotographically and thermo-mass transfer, the particular technique selected depending upon the materials used to provide the graphic design and the graphic film. It is possible for graphic 16a to include graphic design 20a but for graphic 16b to not be provided with a corresponding graphic design 20b.

Adhesive 22a is optional and may be provided by any of a wide variety of adhesives conventionally employed to bond graphic articles to a surface. Pressure-sensitive adhesives are particularly useful in this regard. Adhesives based on acrylics, natural rubbers, styrene-isoprene-styrene block copolymers, and silicone-based adhesives such as polydimethylsiloxane and polymethylphenylsiloxane may be used. Adhesives useful in the invention may incorporate additives such as ground glass, titanium dioxide, silica, glass beads, waxes, tackifiers, low molecular weight thermoplastics, oligomeric species, plasticizers, pigments, metallic flakes, metallic powders, etc. so long as they are provided in an amount that does not materially adversely affect the ability of the adhesive to bond the graphic film to a surface.

The surface of the adhesive which is to be applied to a substrate may be treated to permit repositioning of the graphic before a permanent bond is formed. Adhesive repositionability may be achieved by providing a layer of minute glass bubbles on the adhesive surface, as illustrated in U.S.-A-3,331,729. Alternatively, the adhesive may be formulated to provide low initial adhesion but greater ultimate adhesion. An example of such an adhesive is an isooctyl acrylate/acrylimide adhesive to the backbone of which is grafted a monovalent siloxane polymeric moiety having a number average molecular weight between about 500 and 50,000.

If an adhesive is not provided, the graphic may be secured to an article by surface tension or by applying adhesive directly to the article.

Graphic carrier release liner 24a protects adhesive 22a (or the corresponding major face of graphic film 18a if no adhesive is provided) from abrasion, dirt and other adhesion reducing contaminants until first graphic 16a has been applied. The release liner should be readily removable without damage to the graphic. Release liners conventionally employed for protecting adhesively bonded graphics may be used in accordance with the present invention and include those which are either resin or paper-based and having silicone, polysilicone, fluorocarbon, polyfluorocarbon, wax or polyolefin coatings thereon.

As noted hereinabove, premask 26 extends continuously and uninterrupted over both graphic carrier 12 and extension portion 14 and is releasably secured to major faces thereof opposite the major faces which engage release liner sections 24a and 24b. The premask may be provided by any of the materials which have been conventionally employed with graphics. The premask comprises protective layer 28 with adhesive 30 coated thereon. The protective layer may be paper or a polymeric film. Materials suitable for the adhesive include natural rubbers, acrylics, and other adhesives which have been conventionally employed with premasks. Pressure-sensitive adhesives are particularly useful. Adhesive 30 should demonstrate less adhesion to first graphic 16a than adhesive 22a (if included) provides between graphic film 18a and the surface to which the graphic is to be applied. Thus, the premask may be readily stripped from the first graphic once the graphic has been applied to a surface.

In assembly, graphic applicator 10 is generally established by providing composite precursor construction 10' and performing certain cutting operations thereon. Removable premask 26 is applied after performing the cutting operations. Thus, in one approach, a roll or sheet of bulk graphic film 18 of appropriate dimensions is provided. If desired, one face of the bulk film has optional adhesive 22 deposited thereon by roll coating, extrusion coating, gravure printing, Meyer bar, knife blade and the like. Release liner 24 is subsequently laminated or otherwise applied as a continuous sheet to bulk film 18. Optional graphic design 20 may be applied to the exposed face of the bulk film such as by screen

printing and the like. In the embodiment of FIG. 1, application of the design and the adhesive to bulk film 18 provides graphic 16. Adding release liner 24 provides the composite precursor construction 10' shown in FIG. 1. The various assembly steps may be carried out in a different order if desired. For example, the release liner may be applied after the decorative design is provided. This is useful where the graphic design and the adhesive are applied to/deposited on the same face of the graphic film.

In any event, once composite precursor construction 10' has been provided, it is passed to a cutting station where a cutting device such as a steel rule die, a hot magnesium die, a combination of these dies, a computer controlled cutting device (e.g., a laser), or the like simultaneously performs, first and second cutting operations by, respectively, "kiss-cutting" and "through-cutting" the precursor construction. More specifically, the cutting device "kiss-cuts" graphic 16 but does not sever the corresponding underlying portion of release liner 24. However, the same cutting device also substantially "through-cuts" composite precursor construction 10' to substantially sever both graphic 16 and the corresponding underlying portion of release liner 24.

The "kiss-cutting" operation provides graphic 16 with its overall shape. Once graphic 16 has been "kiss-cut," excess or waste material is removed or weeded to establish graphic carrier 12 and extension portion 14 comprising their respective individual elements (designated separately above with the letters "a" and "b" appended to the appropriate reference numeral).

The "through-cutting" operation substantially severs or separates release liner 24 thereby creating an alignment edge 32 (the dimensions of the gap being exaggerated in FIG. 3) between release liner sections 24a and 24b, the significance of which is explained more fully hereinbelow. By "substantially severs or separates" it is meant that the release liner can be cut completely through or perforated such that the perforations can be easily broken to separate release liner 24 into sections 24a and 24b. Importantly, the distance between an end 34 of graphic 16a and alignment edge 32 can be carefully controlled by appropriate configuration of the "kiss-cut" and "through-cut" elements of the cutting device.

Once composite precursor construction 10' has been simultaneously "kiss-cut" and "through-cut," pre-mask 26 may be laminated or otherwise applied. Once pre-mask 26 has been applied, graphic applicator 10 is passed to a final cutting station where release liner 24 and the pre-mask are "through-cut" to provide the graphic applicator with its final configuration as defined by peripheral edge 36 in FIG. 2.

An alternative embodiment is shown in FIG. 4 wherein a graphic applicator 40 according to the invention comprises a graphic 42 similar to graphic 16 and including a graphic film 44 having an optional graphic design 46 on one major face and an optional adhesive 48 on the opposite (or the same) major face. A pre-mask

50 (similar to pre-mask 26) is releasably laminated or otherwise attached to one major face of graphic 42 and includes a protective layer 52 and an adhesive layer 54. A release liner 56 is removably laminated or otherwise secured to the other major face of graphic 42 and is similar to release liner 24. Release liner 56 includes first and second opposed ends 57 and 58 and is segregated into a first release liner section 56a that is adjacent to and at least substantially separated from (either by a through cut or a perforated cut) a second release liner section 56b. The separation between release liner sections 56a and 56b (or one of the facing release liner section edges) is designated by the reference numeral 59, is functionally analogous to alignment edge 32, and provides means for aligning graphic 42 with respect to a fixed reference. (The dimensions of the separation between release liner sections 56a and 56b is exaggerated in FIG. 4.)

The embodiment of FIG. 4 is particularly useful when graphic 42 is to be applied to a surface that wraps around a corner; for example, a motor vehicle bumper that extends along the rear of the vehicle and wraps around to the side of the vehicle, the fixed reference being a feature on the bumper.

The embodiment of FIG. 4 may be provided by starting with a composite precursor construction having essentially the configuration shown in FIG. 1. More specifically, a composite precursor construction like that shown in FIG. 1 is "kiss cut" without cutting through a corresponding underlying portion of graphic 42 (the precursor construction being arranged in the cutting device in an "upside down" orientation). However, the same cutting device also "through cuts" the composite precursor construction to sever both graphic 42 and the corresponding overlying portion of release liner 56. The "kiss cutting" operation provides alignment edge 59 by substantially severing or separating release liner 56 into release liner sections 56a and 56b. The "through cutting" operation provides both the graphic and the applicator with their final shapes.

If the embodiment of FIG. 4 is provided with a graphic design an alternative manufacturing process may be employed. In the alternative process, graphic film 44 is provided with registration holes (not shown in the drawings) which receive pins that secure the film while the graphic design is formed on the graphic film. Once a composite precursor construction like that shown in FIG. 1 is provided (which may also include a pre-mask that has registration holes). It is placed in a first cutting device in an upside down configuration and release liner 56 is cut without cutting through a corresponding portion of the graphic film. The cut in the release liner provides the alignment means. Once so cut, the precursor construction is transferred to a second device which cuts through the graphic film, the release liner and the pre-mask (if provided). To ensure proper registration of the graphic design with the alignment means, pins in the first and second cutting devices are received by the registration holes in the graphic film.

Contrary to the above described processes, in the manufacture of presently known graphics, the corresponding first cutting step "kiss-cuts" the graphic film without "through-cutting" the release liner. Thus, presently known graphic applicators do not comprise a release liner having an alignment edge formed therein. A premask is separately applied followed by a second cutting operation in a separate cutting device which "through-cuts" the release liner and the premask and which provides the alignment indicia on the premask. (Constructions in which a graphic applicator comprises analogous graphic carrier and extension portions, the release liner between the two being severed, are known but the alignment means is carried by the premask.)

The use and operation of either graphic applicator 10 or graphic applicator 40 follows readily from the previously described constructions. Turning now to FIG. 5 (and with specific reference to graphic applicator 10) first graphic 16a is to be applied to a surface 60, such as a motor vehicle body panel, in vertical alignment with and at a predetermined distance from a fixed reference 62. Fixed reference 62 could be a body panel edge, a door edge, a window surround, a molding, a trim piece, a mirror housing, an antenna, another already applied graphic, etc. on the same surface or on an adjacent noncontiguous surface to which the graphic is to be applied, the graphic applicator being fully useable in either context as explained below. Furthermore, although, fixed reference 62 is illustrated in a vertical orientation, this is merely a schematic representation, and the fixed reference could extend horizontally or at some intermediate angle.

In order to vertically align graphic 16a with fixed reference 62, alignment edge 32 is superimposed on (i.e., aligned with) the fixed reference. Because alignment edge 32 was established in the same cutting step as end 34 of graphic 16a, edge 32 and end 34 are inherently aligned with respect to each other. Consequently, end 34 (as well as the rest of first graphic 16a) is also inherently aligned with fixed reference 62 once alignment edge 32 is superimposed. Furthermore, the distance between end 34 and fixed reference 62 is determined by the distance between end 34 and alignment edge 32, which distance can be tailored by appropriate configuration of the "kiss-cut" and "through-cut" elements of the cutting device. Thus, alignment edge 32 provides a means for aligning and spacing end 34 and the rest of first graphic 16a relative to a fixed reference by positioning the alignment edge at the fixed reference.

Typically, release liner 24a is peeled away before alignment edge 32 is positioned relative to fixed reference 62. Removal of release liner section 24a increases the amount of light which is transmitted through graphic carrier 12 relative to extension portion 14 thereby highlighting the position of alignment edge 32 and facilitating its use as an alignment means with respect to fixed reference 62. First graphic 16a is adhered to surface 60 by applying pressure (for example, by using a squeegee) to premask 26. Once first graphic 16a has been so

applied, graphic film 18a usually has sufficient integrity to be squeegeed flat without developing bubbles, wrinkles, creases or swells. Rendering adhesive 22a repositionable may facilitate applying the graphic. Once first graphic 16a has been applied to surface 60, premask 26 is stripped away. (Extension portion 14 is removed simultaneously with premask 26 because the premask is continuous over both graphic carrier 12 and the extension portion.)

Extension portion 14 is particularly useful for horizontally aligning first graphic 16a with an adjacent portion of another graphic 64 which has already been applied. In such constructions, graphic 16b of extension portion 14 includes graphic design 20b which complements the already applied graphic, and preferably, any graphic design 16a associated with graphic carrier 12. Thus, if first graphic 16a provides one section of a larger graphic (for example, a pinstripe which runs the length of a motor vehicle), portions of which have already been applied (for example to a front door), then second graphic 16b on extension portion 14 may be overlaid on already applied graphic 64. In this manner, first graphic 16a (which, for example, is to be applied to the adjacent rear door) can be horizontally aligned with the front door graphic. (Presumably alignment edge 32 would be superimposed on the edge of one of the doors or on an edge of the already applied graphic so as to also vertically align first graphic 16a). Surface 66 to which graphic 64 has been applied may be separated from surface 60 (as shown in FIG. 5) or contiguous therewith.

Graphic applicator 40 is used in a manner analogous to that described for graphic applicator 10. More specifically, first release liner section 56a is removed thereby highlighting the position of alignment edge 59 which is superimposed on (i.e., aligned with) the fixed reference. That portion of graphic 42 which overlay release liner section 56a is squeegeed flat. Then, in a preferably single continuous motion, release liner section 56b is removed and the remainder of graphic 42 is applied to the surface.

Thus, in graphic applicator 40 only release liner sections 56a and 56b are removed and discarded. In graphic applicator 10, release liner section 24a is removed along with the entire extension portion 14.

A significant aspect of the invention resides in the provision of a graphic applicator in which the means for aligning the graphic with respect to a fixed reference is carried by the release liner. The alignment means is a through cut or a perforated cut in the release liner. The alignment means is positioned either between opposed ends of the release liner (such as shown in FIG. 4) or provides the separation between the graphic and a disposable extension portion (such as shown in FIGS. 2 and 3). The release liner can be kiss cut to provide the alignment means, with simultaneous through cutting of other portions of the graphic and the release liner to provide the graphic with its overall shape. Alternatively, the through cutting of the graphic and the release liner can occur separately from the kiss cutting of the release

liner if registration holes in the applicator receive pins in the first and second cutting devices, so long as the registration holes were used during the formation of a graphic design on the graphic film. In a third approach, the alignment means may be formed in a cutting operation which "kiss-cuts" the graphic while simultaneously "through-cutting" other portions of the graphic and the release liner, the "through-cut" release liner edge being the alignment means. The simultaneous second cutting operation inherently aligns an end of the graphic with the alignment means and establishes the spacing therefrom.

Graphic applicators according to the invention provides an efficient, effective, readily usable technique for aligning a graphic relative to a fixed reference and with a precision not heretofore believed possible.

Claims

1. A device for aligning a graphic on a surface with respect to a fixed reference on the same surface or on an adjacent surface, the device comprising:

(a) a graphic carrier (12) comprising:

- (1) a graphic carrier release liner (24a) having a release surface, and
- (2) a first graphic (14a) releasably secured to the release surface of the release liner (24a), the first graphic (14a) having an edge (34), a top face, a bottom face opposite the top face, a graphic design (20a), and a layer of adhesive (22a) on the bottom face and against the release surface of the release liner (24a).

(b) a disposable, removable portion (14) adjacent to the graphic carrier (12), the disposable, removable portion (14) comprising:

- (1) a second release liner (24b) having a release surface, wherein the second release liner (24b) is adjacent to and separated from the graphic carrier release liner (24a) by a cut portion (32), and
- (2) a second graphic (14b) releasably secured to the release surface of the second release liner (24b), the second graphic (14b) having an edge, a top face, a bottom face opposite the top face, a graphic design (20b), and a layer of adhesive (22b) on the bottom face and against the release surface of the second release liner (24b), wherein the second graphic (14b) is adjacent to and separated from the first graphic (14a) by a cut portion, and

(c) a continuous premask (26) removably attached to the top face of the first graphic

(14a) and the top face of the second graphic (14b), the premask (26) comprising a substrate (28) and a layer of adhesive (30) on the substrate (28) and against the top faces of the first and second graphics (14a,b), wherein the cut portion (32) that separates the graphic carrier release liner (24a) and the second release liner (24b) is inherently aligned with the edge (34) of the first graphic (14a), and aligns the first graphic (14a) with respect to the fixed reference.

2. A device according to claim 1 wherein the cut portion between the graphic carrier release liner (24a) and the second release liner (24b) is a perforated cut.
3. A device according to claim 1 wherein the cut portion between the graphic carrier release liner (24a) and second release liner (24b) is a continuous cut (32).
4. A device according to claim 1 wherein the layer of adhesive (22a) on the first graphic (14a) is a pressure sensitive adhesive.
5. A method of aligning a device according to claim 1 wherein the distance from the edge of the first graphic to the cut portion that separates the graphic carrier release liner and the second release liner is substantially equal to the distance from the edge (34) of the first graphic (14a) to a fixed reference of a surface on which the first graphic (14a) has to be aligned with respect to the fixed reference, when the first graphic (14a) is on the surface to which it is to be applied.
6. A method of making a device for aligning a graphic on a surface, the method comprising the steps of:
 - (a) providing a release liner (24a,b;56) having a release surface,
 - (b) providing a graphic (14a,b;42) having a top face, a bottom face opposite the top face, and a layer of adhesive (22a,b;48) on the bottom face,
 - (c) preparing a precursor construction (10') by releasably attaching the graphic (14a,b;42) and the release liner (24a,b;56) wherein the layer of adhesive (22a,b;48) on the bottom face of the graphic (14a,b;42) is against the release surface of the release liner (24a,b;56), and
 - (d) simultaneously performing first and second cutting operations on the precursor construction (10'), wherein the first cutting operation comprises kiss-cutting the release liner (24a,b;56), and the second cutting operation comprises through-cutting the graphic (14a,b;42) and the release liner (24a,b;56), and further

wherein the cut (32) in the release liner (24a,b;56) formed in the first cutting operation can be used to align the graphic (14a,b;42) on a surface.

7. A method according to claim 6 further comprising the step of attaching a removable premask (26;50) to the top face of the graphic (14a,b;42) after the first and second cutting operations.

8. A method according to claim 7 further comprising the step of through-cutting the release liner (24a,b;56), the graphic (14a,b;42) and the premask (26;50).

9. A method according to claim 6 further comprising the step of printing a graphic design (20a,b;46) on either the top face or the bottom face of the graphic (14a,b;42).

10. A method of making a device for aligning a graphic on a surface, the method comprising the steps of:

(a) providing a release liner (24a,b;56) having a release surface,

(b) providing a graphic (14a,b;42) having a top face, a bottom face opposite the top face, and a layer of adhesive (22a,b;48) on the bottom face,

(c) preparing a precursor construction (10') by releasably attaching the graphic (14a,b;42) and the release liner (24a,b;56) wherein the layer of adhesive (22a,b;48) on the bottom face of the graphic (14a,b;42) is against the release surface of the release liner (24a,b;56), and

(d) simultaneously performing first and second cutting operations on the precursor construction (10'), wherein the first cutting operation comprises kiss-cutting the graphic (14a,b;42), and the second cutting operation comprises through-cutting the graphic (14a,b;42) and the release liner (24a,b;56), and further wherein the cut in the release liner (24a,b;56) formed in the second cutting operation can be used to align the graphic on a surface.

11. A method according to claim 10 further comprising the step of attaching a removable premask (26;50) to the top face of the graphic (14a,b;42) after the first and second cutting operations.

12. A method according to claim 11 further comprising the step of through-cutting the release liner (24a,b;56), the graphic (14a,b;42) and the premask (26;50).

13. A method according to claim 10 further comprising the step of printing a graphic design (20a,b;46) on either the top face or the bottom face of the graphic

(14a,b;42).

14. A method of making a device for aligning a graphic on a surface, the method comprising the steps of:

(a) providing a precursor construction (10') comprising

(1) a release liner (24a,b;56) having a release surface, and

(2) a graphic (14a,b;42) releasably secured to the release surface of the release liner (24a,b;56), the graphic (14a,b;42) having a top face, a bottom face opposite the top face, a layer of adhesive (22a,b;48) on the bottom face and against the release surface of the release liner (24a,b;56), and registration holes formed therethrough,

(b) printing a design (20a,b;46) on the top face of the graphic (14a,b;42) while the precursor (10') is secured against movement by registration pins that are received by the registration holes in the graphic (14a,b;42),

(c) performing a first cutting operation comprising kiss-cutting the release liner (24a,b;56) while the precursor (10') is secured against movement by registration pins that are received by the registration holes in the graphic (14a,b;42), wherein the cut formed in the release liner (24a,b;56) can be used to align the graphic (14a,b;42) to a surface, and

(d) performing a second cutting operation after the first cutting operation, the second cutting operation comprising through-cutting the graphic (14a,b;42) and the release liner (24a,b;56).

15. A method according to claim 14 further comprising the steps of releasably attaching a premask (26;50) to the top face of the graphic and through-cutting the premask (26;50) in the second cutting operation.

Patentansprüche

1. Vorrichtung zur Ausrichtung einer Grafik auf einer Fläche relativ zu einem festen Bezugspunkt auf derselben Fläche oder auf einer angrenzenden Fläche, mit:

(a) einem Grafikträger (12) mit:

(1) einer Grafikträgerablösefolie (24a) mit einer Ablösefläche und

(2) einer ersten lösbar an der Ablösefläche der Ablösefolie (24a) gesicherten ersten

- (a) Vorsehen einer Ablösefolie (24a, b; 56) mit einer Ablösefläche, 5
- (b) Vorsehen einer Grafik (14a, b; 42) mit einer oberen Seite, einer der oberen Seite gegenüberliegenden unteren Seite und einer Klebstoffschicht (22a, b; 48) auf der unteren Seite, 10
- (c) Vorbereiten einer Vorläuferstruktur (10') durch lösbares Anbringen der Grafik (14a, b; 42) und der Ablösefolie (24a, b; 56), wobei die Klebstoffschicht (22a, b; 48) auf der unteren Seite der Grafik (14a, b; 42) an die Ablösefläche der Ablösefolie (24a, b; 56) angrenzt, und 15
- (d) gleichzeitiges Durchführen erster und zweiter Schneidevorgänge an der Vorläuferstruktur (10'), wobei der erste Schneidevorgang umfaßt, die Grafik (14a, b; 42) anzuschneiden, und der zweite Schneidevorgang umfaßt, die Grafik (14a, b; 42) und die Ablösefolie (24a, b; 56) durchzuschneiden, und wobei ferner der bei dem ersten Schneidevorgang gebildete Schnitt (32) in die Ablösefolie (24a, b; 56) verwendet werden kann, um die Grafik (14a, b; 42) auf einer Fläche auszurichten. 20 25
11. Verfahren nach Anspruch 10, ferner mit dem Schritt des Anbringens einer entfernbaren Vormaske (26; 50) an der oberen Seite der Grafik (14a, b; 42) nach den ersten und zweiten Schneidevorgängen. 30
12. Verfahren nach Anspruch 11, ferner mit dem Schritt des Durchschneidens der Ablösefolie (24a, b; 56), der Grafik (14a, b; 42) und der Vormaske (26; 50). 35
13. Verfahren nach Anspruch 10, ferner mit dem Schritt des Druckens eines Grafikdesigns (20a, b; 46) auf entweder die obere Seite oder die untere Seite der Grafik (14a, b; 42). 40
14. Verfahren zur Herstellung einer Vorrichtung zum Ausrichten einer Grafik auf einer Fläche, mit folgenden Schritten: 45
- (a) Vorsehen einer Vorläuferstruktur (10') mit
- (1) einer Ablösefolie (24a, b; 56) mit einer Ablösefläche und 50
- (2) einer an der Ablösefläche der Ablösefolie (24a, b; 56) lösbar gesicherten Grafik (14a, b; 42), wobei die Grafik (14a, b; 42) eine obere Seite, eine der oberen Seite gegenüberliegende untere Seite, eine Klebstoffschicht (22a, b; 56) an der unteren Seite, die an die Ablösefläche der Ablösefolie (24a, b; 56) angrenzt, und durch dies sich erstreckende Registrati- 55

onslöcher aufweist,

(b) Drucken eines Designs (20a, b; 46) auf die obere Seite der Grafik (14a, b; 42), während der Vorläufer (10') gegen Bewegung durch Registrationsstifte, die von den Registrationslöchern in der Grafik (14a, b; 42) aufgenommen werden, gesichert ist,

(c) Durchführen eines ersten Schneidevorgangs, der umfaßt, die Ablösefolie (24a, b; 56) anzuschneiden, während der Vorläufer (10') gegen Bewegung durch Registrationsstifte, die von den Registrationslöchern in der Grafik (14a, b; 42) aufgenommen werden, gesichert ist, wobei der in der Ablösefolie (24a, b; 56) gebildete Schnitt verwendet werden kann, um die Grafik (14a, b; 42) auf einer Fläche auszurichten, und

(d) Durchführen eines zweiten Schneidevorgangs nach dem ersten Schneidevorgang, wobei der zweite Schneidevorgang umfaßt, die Grafik (14a, b; 42) und die Ablösefolie (24a, b; 56) durchzuschneiden.

15. Verfahren nach Anspruch 14, ferner mit den Schritten des lösbaren Anbringens einer Vormaske (26; 50) an der oberen Seite der Grafik und Durchschneidens der Vormaske (26; 50) bei dem zweiten Schneidevorgang.

Revendications

1. Dispositif pour aligner un graphique sur une surface, par rapport à une référence fixe située sur cette même surface ou sur une surface adjacente, le dispositif comprenant:

(a) un support de graphique (12), comprenant:

(1) une couverture non-adhérente de support de graphique (24a) ayant une surface non-adhérente, et

(2) un premier graphique (14a), fixé de manière amovible à la surface non-adhérente de la couverture non-adhérente (24a), le premier graphique (14a) comportant un bord (34), une face supérieure, une face inférieure opposée à la face supérieure, un dessin graphique (20a), et une couche de colle (22a) sur la face inférieure et contre la surface non-adhérente de la couverture non-adhérente (24a),

(b) une partie jetable amovible (14), adjacente au support de graphique (12), la partie jetable amovible (14) comprenant:

- (1) une deuxième couverture non-adhérente (24b) ayant une surface non-adhérente, dans lequel la deuxième couverture non-adhérente (24b) est adjacente à, et séparée de, la couverture non-adhérente du support de graphique (24a), par une partie découpée (32), et
- (2) un deuxième graphique (14b), fixé de manière amovible à la surface non-adhérente de la deuxième couverture non-adhérente (24b), le deuxième graphique (14b) comportant un bord, une face supérieure, une face inférieure opposée à la face supérieure, un dessin graphique (20b), et une couche de colle (22b) sur la face inférieure et contre la surface non-adhérente de la deuxième couverture non-adhérente (24b), dans lequel le deuxième graphique (14b) est adjacent au, et séparé du, premier graphique (14a) par une partie découpée, et
- (c) un prémasque continu (26), fixé de manière amovible à la face supérieure du premier graphique (14a), et à la face supérieure du deuxième graphique (14b), le prémasque (26) comprenant un substrat (28) et une couche de colle (30) sur le substrat (28), et contre les faces supérieures des premier et deuxième graphiques (14a,b), dans lequel la partie découpée (32) qui sépare la couverture non-adhérente de support de graphique (24a) et la deuxième couverture non-adhérente (24b), est alignée de façon inhérente avec le bord (34) du premier graphique (14a), et est alignée avec le premier graphique (14a) par rapport à la référence fixe.
2. Dispositif selon la revendication 1, dans lequel la partie découpée située entre la couverture non-adhérente de support de graphique (24a) et la deuxième couverture non-adhérente (24b) est une découpe perforée.
3. Dispositif selon la revendication 1, dans lequel la partie découpée située entre la couverture non-adhérente de support de graphique (24a) et la deuxième couverture non-adhérente (24b) est une découpe continue (32).
4. Dispositif selon la revendication 1, dans lequel la couche de colle (22a) située sur le premier graphique (14a) est une colle sensible à la pression.
5. Procédé d'alignement d'un dispositif selon la revendication 1, dans lequel la distance entre le bord du premier graphique et la partie découpée qui sépare la couverture non-adhérente de support de graphique et la deuxième couverture non-adhérente est sensiblement égal à la distance entre le bord (34) du premier graphique (14a) et une référence fixe d'une surface sur laquelle doit être aligné le premier graphique (14a) par rapport à la référence fixe, lorsque le premier graphique (14a) est sur la surface sur laquelle il doit être appliqué.
6. Procédé de fabrication d'un dispositif pour aligner un graphique sur une surface, le procédé comprenant les étapes de:
- (a) fourniture d'une couverture non-adhérente (24a,b;56), ayant une surface non-adhérente,
- (b) fourniture d'un graphique (14a,b;42), ayant une face supérieure, une face inférieure opposée à la face supérieure, et une couche de colle (22a,b;48) sur la face inférieure,
- (c) réalisation d'une construction de précurseur (10), en fixant de manière amovible le graphique (14a,b;42) et la couverture non-adhérente (24a,b;56), dans lequel la couche de colle (22a,b;48) située sur la face inférieure du graphique (14a,b;42) se trouve contre la surface non-adhérente de la couverture non-adhérente (24a,b;56), et
- (d) exécution simultanée d'une première et d'une deuxième opérations de découpe sur la construction de précurseur (10), dans lequel la première opération de découpe comprend la découpe superficielle de la couverture non-adhérente (24a,b;56), et la deuxième opération de découpe comprend la découpe traversante du graphique (14a,b;42) et de la couverture non-adhérente (24a,b;56), et dans lequel en outre, la découpe (32) dans la couverture non-adhérente (24a,b;56), formée lors de la première opération de découpe, peut être utilisée pour aligner le graphique (14a,b;42) sur une surface.
7. Procédé selon la revendication 6, comprenant en outre l'étape de fixation d'un prémasque amovible (26;50), à la face supérieure du graphique (14a,b;42), après les première et deuxième opérations de découpe.
8. Procédé selon la revendication 7, comprenant en outre l'étape de découpe traversante de la couverture non-adhérente (24a,b;56), du graphique (14a,b;42) et du prémasque (26;50).
9. Procédé selon la revendication 6, comprenant en outre l'étape d'impression d'un dessin graphique (20a,b;46) sur l'une ou l'autre parmi la face supérieure et la face inférieure du graphique (14a,b;42).
10. Procédé de fabrication d'un dispositif pour aligner un graphique sur une surface, le procédé comprenant les étapes de:

- (a) fourniture d'une couverture non-adhérente (24a,b;56), ayant une surface non-adhérente,
 (b) fourniture d'un graphique (14a,b;42), ayant une face supérieure, une face inférieure opposée à la face supérieure, et une couche de colle (22a,b;48) sur la face inférieure, 5
 (c) réalisation d'une construction de précurseur (10'), en fixant de manière amovible le graphique (14a,b;42) et la couverture non-adhérente (24a,b;56), dans lequel la couche de colle (22a,b;48) située sur la face inférieure du graphique (14a,b;42) se trouve contre la surface non-adhérente de la couverture non-adhérente (24a,b;56), et 10
 (d) exécution simultanée d'une première et d'une deuxième opérations de découpe sur la construction de précurseur (10'), dans lequel la première opération de découpe comprend la découpe superficielle du graphique (14a,b;42), et la deuxième opération de découpe comprend la découpe traversante du graphique (14a,b;42) et de la couverture non-adhérente (24a,b;56), et dans lequel en outre, la découpe dans la couverture non-adhérente (24a,b;56), formée lors de la première opération de découpe, peut être utilisée pour aligner le graphique sur une surface. 15 20 25
11. Procédé selon la revendication 10, comprenant en outre l'étape de fixation d'un prémasque amovible (26;50), à la face supérieure du graphique (14a,b;42), après les première et deuxième opérations de découpe. 30
12. Procédé selon la revendication 11, comprenant en outre l'étape de découpe traversante de la couverture non-adhérente (24a,b;56), du graphique (14a,b;42) et du prémasque (26;50). 35
13. Procédé selon la revendication 10, comprenant en outre l'étape d'impression d'un dessin graphique (20a,b;46) sur l'une ou l'autre parmi la face supérieure et la face inférieure du graphique (14a,b;42). 40
14. Procédé de fabrication d'un dispositif pour aligner un graphique sur une surface, le procédé comprenant les étapes de: 45
- (a) fourniture d'une construction de précurseur (10') comprenant 50
- (1) une couverture non-adhérente (25a,b;56), ayant une surface non-adhérente, et
- (2) un graphique (14a,b;42), fixé de manière amovible sur la surface non-adhérente de la couverture non-adhérente (24a,b;56), le graphique (14a,b;42) ayant une face supérieure, une face inférieure 55

opposée à la face supérieure, une couche de colle (22a,b;48) sur la face inférieure et contre la surface non-adhérente de la couverture non-adhérente (24a,b;56), et des trous de positionnement formés à travers,

- (b) impression d'un dessin (20a,b;46) sur la face supérieure du graphique (14a,b;42), pendant que le précurseur (10') est fixé contre le mouvement par des aiguilles de positionnement qui sont reçues par les trous de positionnement situés dans le graphique (14a,b;42),
 (c) exécution d'une première opération de découpe comprenant la découpe superficielle de la couverture non-adhérente (24a,b;56) pendant que le précurseur (10') est fixé contre le mouvement par les aiguilles de positionnement qui sont reçues par les trous de positionnement situés dans le graphique (14a,b;42), dans lequel la découpe formée dans la couverture non-adhérente (24a,b;56) peut être utilisée pour aligner le graphique (14a,b;42) sur une surface, et
 (d) exécution d'une deuxième opération de découpe, après la première opération de découpe, la deuxième opération de découpe comprenant la découpe traversante du graphique (14a,b;42) et de la couverture non-adhérente (24a,b;56).

15. Procédé selon la revendication 14, comprenant en outre les étapes de fixation d'un prémasque (26;50) d'une manière amovible, à la face supérieure du graphique, et de découpe traversante du prémasque (26;50) lors de la deuxième opération de découpe.

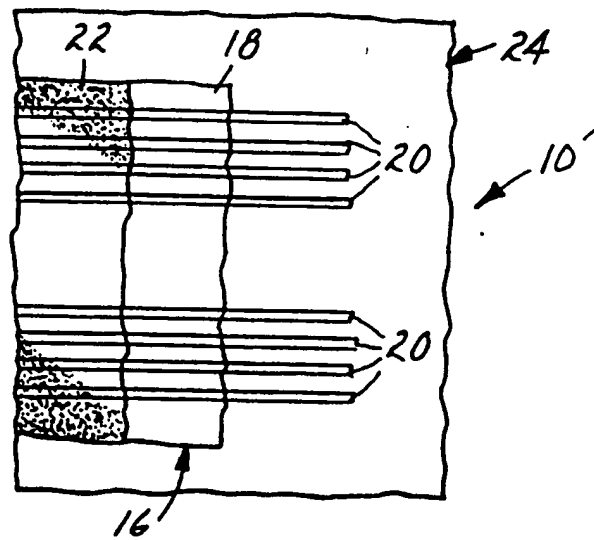


FIG. 1

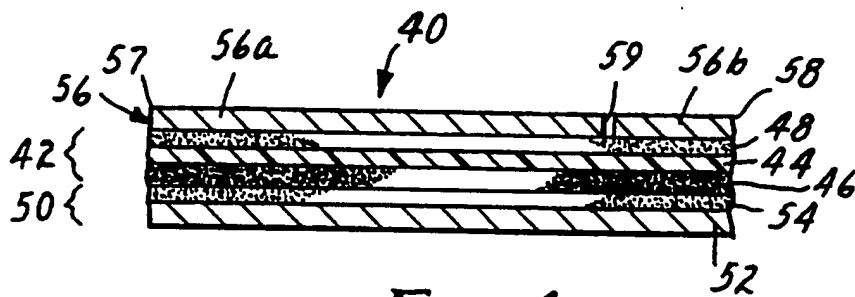


FIG. 4

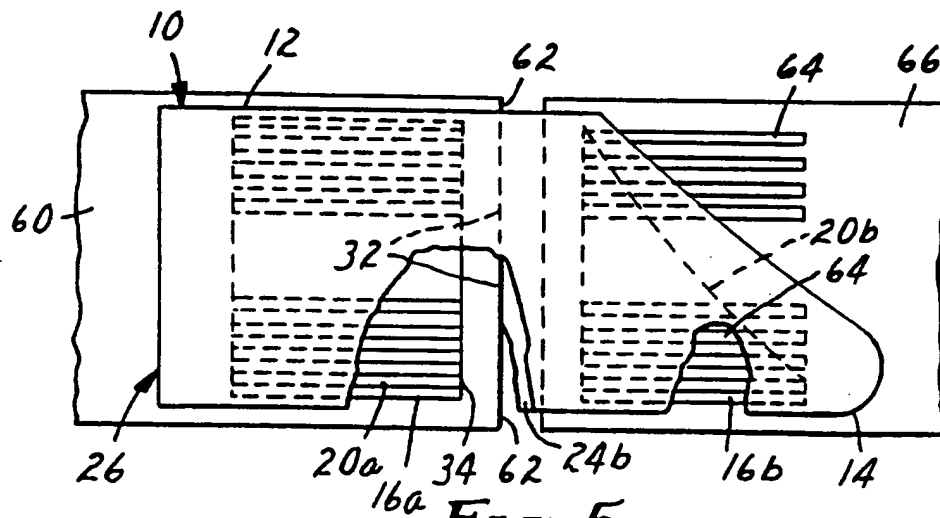


FIG. 5

